

Taxonomy and distribution of *Sardinella leiogaster* Valenciennes, 1847 [Pisces: Clupeidae] from the Indian Seas¹

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(With a text-figure)

INTRODUCTION

The Indo-Pacific representatives of the genus *Sardinella* Valenciennes fall into two subgenera, *Sardinella* Valenciennes and *Amblygaster* Bleeker distinguished, one from the other, by the degree of compression in the ventral keel and scutes, and by marked differences in the arrangement of the scales along the median line anterior to the dorsal fin. The specific identity of *S. (Amblygaster) leiogaster* Valenciennes has been in great confusion, the species having either placed in the synonymy of *Sardinella sirm* (Walbaum) (by Regan 1917; Fowler 1941; Misra 1947) or confused with *Sardinella clupeoides* (Bleeker) (Bertin 1944). Recently Chan (1965), Whitehead, Boeseman & Wheeler (1966), and Whitehead (1967a) revised systematics and recognised *Sardinella sirm* (Walbaum), *S. clupeoides* (Bleeker) and *S. leiogaster* Valenciennes as three distinct species under the subgenus *Amblygaster*.

During a recent survey of the Andaman and Nicobar group of Islands, as a part of a comprehensive programme of survey of the ichthyo-fauna of these islands by the senior author, a specimen 242 mm in total length, of *Sardinella leiogaster* Valenciennes, hitherto not recorded from Indian waters, was collected from the Car Nicobar

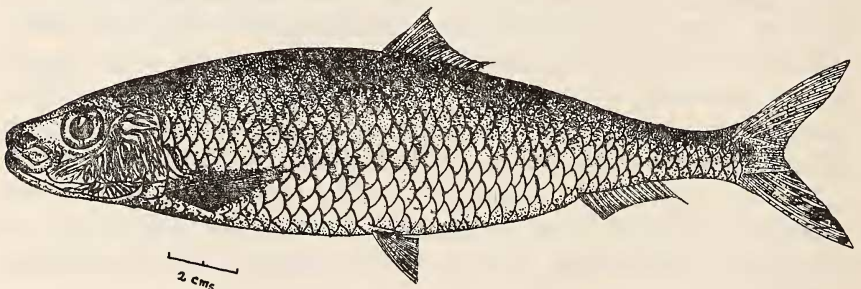
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Island on 14th March, 1969. This species has so far been known to occur from the East African coast, the Red Sea, Indian Ocean, Singapore, the East Indies and the Philippines (*vide* Whitehead 1967b). It is here recorded for the first time from the Indian waters. The specific identity of earlier records (Day 1878; Hornell 1917; Deraniyagala 1929, 1952; Munro 1955; Kuthalingam 1961) of the three species of the subgenus *Amblygaster* from the Indian Seas are discussed.

SYSTEMATIC ACCOUNT

***Sardinella (Amblygaster) leiogaster* Valenciennes**

- Clupea caeruleo-vittata* Richardson,² 1846, *Ichth. China Japan*, p. 305; Whitehead, 1966, *Bull. Br. Mus. nat. Hist. (Zool.)* 14(2):28.
- Sardinella leiogaster* Valenciennes, 1847, *Hist. nat. Poiss.* 20:270 (Indian Ocean); Kner, 1865, *Reise Novara, Fische*: 327; Chan, 1965, *Jap. J. Ichthyol.* 12(3-6): 117, fig. 15; Whitehead, Boeseman & Wheeler, 1966, *Zool. Verhandl. Leiden* 84:47 (Key); Whitehead, 1967, *Bull. Br. Mus. nat. Hist. (Zool.)*,:Suppl. 2: 68 (Redescription of type); Whitehead, 1967, *J. mar. biol. Ass. India* 9(2):235, fig. 13.
- Clupea leiogaster* Klunzinger, 1871, *Verh. zool.-bot. Ges. Wien.* 21: 598.
- Clupea (Amblygaster) leiogaster* Bleeker, 1872, *Atlas Ichthyol. Ind. Neerland.* 6: 102; Weber and de Beaufort (*partim*), 1913, *Fishes Indo-Australian Archipelago* 2:61; Deraniyagala, (*partim*), 1929, *Spoilia Zeylanica* 15:37.
- Sardinella clupeoides* Fowler (*nec.* Bleeker), 1941, *Bull. U.S. nat. Mus.* (100) 13: 619.
- Sardinella (Amblygaster) sirm* Deraniyagala (*nec.* Walbaum) (*partim*), 1952, *Coloured Atlas of some Vertebrates from Ceylon* 1: 14.
- Amblygaster clupeoides* Munro, 1955, *Marine and Fresh water fishes from Ceylon*: 26.



Sardinella (Amblygaster) leiogaster Val.

MATERIAL:

1 ex., 210 mm in standard length; Teetop (Car Nicobar Island); 14th

² putative *nomen oblitum* *vide* Whitehead, *Bull. zool. Nomencl.* 23 (pt. 1): 62-64, 1966.

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DESCRIPTION:

Br. St. VI, D IV 14, P i 16, V i 7, A iii 13.

Scales in the lateral series 42, 11 transverse.

Predorsal scales 14.

Abdominal scutes 16 + 12.

Gillrakers on first arch 17 + 1 + 35.

In percentages of standard length: body depth 22.8; head length 23.3; snout length 7.6, eye-diameter 6.0, length of upper jaw 8.0, length of lower jaw 8.8, pectoral length 15.0, pelvic length 8.5, length of anal fin base 11.9, pre-dorsal distance 51.4, pre-pelvic distance 51.4, pre-anal distance 76.7.

Body oblong, elongated, sides slightly compressed; weakly keeled medio-ventrally, with blunt scutes which are not prominent. Maxilla not reaching to the vertical from anterior edge of eye; two supra-maxillae, the second (posterior) almond-shaped but profiles of both portions meeting the anterior shaft at about the same point as illustrated by Whitehead (1967 *a*, fig. 1a). Pseudobranch present, exposed, about as long as eye-diameter; filaments long, ventral base crescentric and without groove below it. Gillrakers rather short, slender, shorter than the corresponding gill filaments. Cleithral lobe prominent. Fronto-parietal region with 14 longitudinal striae. Teeth absent except for a patch of minute, feeble teeth on tongue and palatines. Opercular bones, postorbitals and suborbitals covered by translucent adipose tissue, under which minute hollow venules spread downwards in a radiating pattern.

Dorsal fin origin equidistant between snout tip and caudal base. Pelvic fin base below first branched dorsal ray.

Scales cycloid, thin; deciduous. Predorsal median ridge before dorsal fin covered by a single longitudinal series of scales. Scaly sheath cover the bases of dorsal and anal fins. Elongated axillary scales in angle of pectoral and pelvic fins. Alar scales present.

Colour in alcohol—Upper one-third slate-grey, flanks pale brownish; tips of jaws dusky. Caudal slightly dusky.

DISCUSSION

Our specimen agrees very well with the description; keys and figures given by Chan (op. cit.), Whitehead, Boeseman & Wheeler (1966), and Whitehead (op. cit.).

Day's (1878, 1889) record of *Clupea leiogaster* (Val.) from Sri

Lanka with the maxilla reaching to below front edge of eye and with 13-20 blue spots along the flanks, is evidently based on an erroneous identity of *Sardinella sirm* (Walb.); there are no spots along the flanks and the maxilla does not reach the vertical through the anterior edge of eye in *S. clupeioides* and *S. leiogaster*, (*vide* Chan, *op. cit.*; Whitehead *et al.*, *op. cit.*). Hornell (*op. cit.*) listed *Clupea leiogaster* (Val.) as one of the principal food fishes caught off Tuticorin (south-east coast of India) and based his identity on Day's (1889) description of the species which is here considered conspecific with *Sardinella sirm*.

Munro's (1955:26) record of *Amblygaster clupeioides* (Blkr.) from Sri Lanka with 17-22+32-33 gillrakers, is undoubtedly *Sardinella leiogaster* Valenciennes as *S. clupeioides* (Blkr.) has a lower count (26-30 vs. 31-36) (*vide* Whitehead *et al.*, *op. cit.*). Deraniyagala (1929, 1952), however, correctly reported *S. clupeioides* from Sri Lanka with 27-29 gillrakers but his *S. sirm* with 30-40 gillrakers is clearly a mixture of both *S. sirm* and *S. leiogaster*. Kuthalingam's (*op. cit.*) record of *S. clupeioides* from Madras is erroneous as in no species of the subgenus *Amblygaster* does the maxilla reach below the middle of the eye.

Hornell (*op. cit.*—as *Clupea leiogaster*) and later Menon (1961) recorded *Sardinella sirm* (Walb.), and Bonnett (1965) reported *Sardinella clupeioides* (Blkr.) for the first time from Indian waters. All the three species of the subgenus *Amblygaster*, therefore, occur in the Indian and Sri Lanka waters. A key to the field identification of the three species of the subgenus *Amblygaster* is given below:

- I. A series of 10-12 dark blue spots along flank; maxilla reaching vertical from anterior eye border *sirm* (Walb.)
- II. No series of spots on flanks; maxilla not reaching vertical from anterior eye border.
 - a. Body moderately heavy; dorsal fin origin slightly nearer to tip of snout than to caudal base; gillrakers 26-30. *clupeioides* (Blkr.)
 - b. Body slender, elongated; dorsal fin origin approximately equidistant between tip of snout and caudal base; gillrakers 31-36 *leiogaster* Val.

SUMMARY

Sardinella (Amblygaster) leiogaster Valenciennes, belonging to the family Clupeidae is recorded for the first time from Indian waters, the earlier record by Hornell (1917) being due to mistaken identity. The specific status of earlier records of the three species of the subgenus *Amblygaster*, which was in great confusion until Chan (1965), Whitehead, *et al.* (1966) and Whitehead (1966) revised the systematics, from the Indian Seas has been cleared and the distributional limits discussed.

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REFERENCES

- BENNETT, P. S. (1965): On *Sardinella clupeioides* (Bleeker) from the coasts of India. *J. mar. biol. Ass. India* 7(1): 208-210.
- BERTIN, L. (1944): Mise au point sur quelques especes de clupeioides. *Bull. Soc. zool. France* 66: 18-25.
- CHAN, W. L. (1965): A systematic revision of the Indo-Pacific clupeioid fishes of the genus *Sardinella* (family Clupeidae). *Jap. Jour. Ichthyol.* 12(3-6): 104-118; *ibid.* 13(1-3): 1-39.
- DAY, F. (1878): The Fishes of India. Vol. I. Williams & Norgate, London. pp. 778.
- (1889): The fauna of British India, including Ceylon and Burma. Fishes. Vol. I. Taylor & Francis, London. pp. 548.
- DERANIYAGALA, P. E. P. (1929): Ceylon Sardines. *Spoilia Zeylanica* 15: 31-48.
- (1952): A coloured atlas of some Vertebrates from Ceylon. Vol. I. Fishes. Ceylon National Museum, Colombo. pp. 149. 34 coloured plates.
- FOWLER, H. W. (1941): Contributions to the biology of the Philippine Archipelago and adjacent regions. *Bull. U. S. nat. Mus.* (100) 13: 1-879.
- HORNELL, J. (1917): A statistical analysis of the fishing industry of Tuticorin (South India). *Madras Fish. Bull.* 11(2): 67-118.
- KUTHALINGAM, M. D. K. (1961): Observations on the feeding habits of some Sardines together with the key to the identification of the young ones of the genus *Sardinella*. *Rec. Indian Mus.* 59: 455-469.
- MENON, A. G. K. (1961): On a collection of fish from the Coromandel Coast of India including Pondicherry and Karaikkal areas. *Rec. Indian Mus.* 59: 369-404.
- MISRA, K. S. (1947): A check-list of the fishes of India, Burma and Ceylon. II Clupeiformes, Bathyclupeiiformes, Galaxiiformes, Scopeliformes and Ateleopiformes. *Rec. Indian Mus.* 45: 377-431.
- MUNRO, I. S. R. (1955): The marine and fresh water fishes of Ceylon. Canberra. 350 p. + 56 pls.
- REGAN, C. T. (1917): A revision of the clupeioid fishes of the genera *Sardinella*, *Harengula*, etc. *Ann. Mag. nat. Hist.* (8) 19: 377-395.
- WHITEHEAD, P. J. P. (1967a): The clupeioid fishes described by Lacepede, Cuvier & Valenciennes. *Bull. Br. Mus. nat. Hist. (Zool.) Suppl.* 2: 1-178.
- (1967b): The clupeioid fishes of Malaya. *J. mar. biol. Ass. India* 9(2): 223-280.
- , BOESEMAN, M. & WHEELER, A. (1966): The types of Bleeker's Indo-Pacific clupeioid and clupeioid species. *Zool. Verhandl. Leiden* 84: 1-152.